

**Translation**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416																									
International application No. <b>PCT/RU2004/000263</b>	International filing date (day/month/year) <b>06.07.2004</b>	Priority date (day/month/year) <b>10.07.2003</b>																								
International Patent Classification (IPC) or national classification and IPC <b>B01J37/03, 37/16, 23/44, 21/18</b>																										
Applicant <b>OBSHESTVO S OGRANICHENNOI OTVETSTVENNOSTJU 'FIZTEKHPRIBOR'</b>																										
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of _____ sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <table border="0"><tr><td><input checked="" type="checkbox"/></td><td>Box No. I</td><td>Basis of the report</td></tr><tr><td><input type="checkbox"/></td><td>Box No. II</td><td>Priority</td></tr><tr><td><input type="checkbox"/></td><td>Box No. III</td><td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td><input type="checkbox"/></td><td>Box No. IV</td><td>Lack of unity of invention</td></tr><tr><td><input checked="" type="checkbox"/></td><td>Box No. V</td><td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VI</td><td>Certain documents cited</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VII</td><td>Certain defects in the international application</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VIII</td><td>Certain observations on the international application</td></tr></table>			<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report																									
Name and mailing address of the IPEA/RU	Authorized officer																									
Facsimile No.	Telephone No.																									

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/RU2004/000263

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:

- ☐ international search (Rule 12.3 and 23.1(b))  
☐ publication of the international application (Rule 12.4)  
☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ the international application as originally filed/furnished

☐ the description:

pages \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ the claims:

nos. \_\_\_\_\_ as originally filed/furnished

nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ the drawings:

sheets \_\_\_\_\_ as originally filed/furnished

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages \_\_\_\_\_

☐ the claims, nos. \_\_\_\_\_

☐ the drawings, sheets/figs \_\_\_\_\_

☐ the sequence listing (*specify*): \_\_\_\_\_

☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages \_\_\_\_\_

☐ the claims, nos. \_\_\_\_\_

☐ the drawings, sheets/figs \_\_\_\_\_

☐ the sequence listing (*specify*): \_\_\_\_\_

☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/RU2004/000263

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	1-5	YES
	Claims		NO
Inventive step (IS)	Claims	1-5	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-5	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: RU 2146172 C1

D2: WO 1995/010481 A

D3: EP 0616846 A1

D4: EP 0879641 A1

D1 describes a method for producing a hydrogenation catalyst comprising palladium by reducing divalent palladium from an initial compound and sedimenting reduced palladium on to a carbon material, using as the latter a mesoporous graphite-type material with average pore size within a range from 40 to 400 Å, mesopore fraction in total pore space of at least 0.5, and degree of graphite similarity of at least 20 %.  $\text{H}_2\text{PdCl}_4$  or  $\text{Pd}(\text{NO}_3)_2$  are used as initial compounds. The proposed method differs from the method described in D1 both by the initial compounds used and by the carbon material.

The method described in D2 presupposes the use of a carbon nanomaterial. Nanotubes and/or fullerenes of formula  $\text{C}_n$  where  $n \geq 60$  are used as the carbon nanomaterial, on to which a complex of formula  $\text{L}_n\text{M}$  in an inert organic solvent is applied,

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/RU2004/000263

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

where L means a metal ligand, preferably cyclooctadiene ( $C_8H_{16}$ ) and triethylphosphine  $[C_2H_5]_3P$ ,  $n=1-8$ , M is a transition metal selected from a group including, among others, Pt, Pd and Au, while mixing with subsequent emission of reaction product, washing to remove excess metal complex, and final heat treatment in vacuum at a temperature exceeding  $1000^\circ C$ . The composition produced according to method D2 is used as a hydrogenation catalyst of organic substances.

The method known from D2 presupposes the use of a carbon nanomaterial, as does the proposed method, but differs from the proposed method both by the initial palladium compound used, and the stages and conditions of its implementation.

In D3 and D4 activated carbon is used as the carbon material to produce a hydrogenation catalyst comprising palladium, and before the application of catalytically active components, in particular selected from the compound  $H_2PdCl_4$  (D3) or  $Pd(NO_3)_2$  (D4), oxidative treatment is performed using hydrogen peroxide (D3) or an acid solution at a pH value of 0-1 (D4).

Therefore, none of the documents D1-D4 describes a method for producing a palladium catalyst presupposing the use of tetra aqua-palladium (II) perchlorate as the initial compound, leading in combination with the conditions of catalyst production to achievement of high dispersivity of reduced palladium, which, in turn, leads to higher catalytic activity.

Therefore, the claimed invention meets the

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/RU2004/000263

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

requirements of novelty and inventive step.